

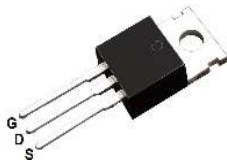


## FEATURES

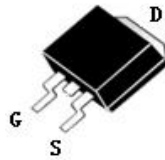
- Ultra-low  $R_{DS(ON)}$
- Low Gate Charge
- 100% UIS Tested, 100% RgTested
- Pb-free Lead Plating
- Halogen-free and RoHS-compliant
- $I_D$  120A
- $V_{DSS}$  85V
- $R_{DS(ON)-typ}(@V_{GS}=10V)$  4.55m

## MECHANICAL DATA

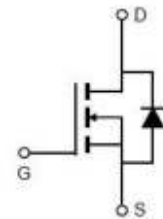
- Case: Molded plastic
- Mounting Position: Any
- Molded Plastic: UL Flammability Classification Rating 94V-0
- Lead free in compliance with EU RoHS 2011/65/EU directive
- Solder bath temperature 275°C maximum, 10s per JESD 22-B106



TO-220C



TO-263C



Schematic Diagram

## APPLICATIONS

- Motor Driving in Power Tool, E-vehicle, Robotics
- Current Switching in DC/DC & AC/DC (SR) Sub-system
- Power Management in Telecom., Industrial Automation, CE

## Product specification classification

Part Number	Package	Mode Name	Pack
LX120N085AP	TO-220C	LX120N085AP	Tape
LX120N085AT	TO-263C	LX120N085AT	Tape



**Maximum Ratings at Tc=25°C unless otherwise specified**

Characteristics	Symbol	Value	Unit
Drain-Source Voltage	$V_{DS}$	85	V
Gate-Source Voltage	$V_{GS}$	$\pm 20$	V
Continue Drain Current	$I_D$	120	A
Pulsed Drain Current (Note1)	$I_{DM}$	465	A
Power Dissipation	$P_D$	208	W
Single Pulse Avalanche Energy (Note1)	$E_{AS}$	338	mJ
Operating Temperature Range	$T_J$	150	°C
Storage Temperature Range	$T_{STG}$	-55 to +150	°C
Thermal Resistance, Junction to Case	$R_{\theta JC}$	0.6	°C/W
Thermal Resistance, Junction to Ambient	$R_{\theta JA}$	45	°C/W

Note1:Pulse test: 300  $\mu$ s pulse width, 2 % duty cycle

**Electrical Characteristics at Tc=25°C unless otherwise specified**

Characteristics	Test Condition	Symbol	Min	Typ	Max	Unit
Drain-Source Breakdown Voltage	$V_{GS} = 0 V, I_D = 250 \mu A$	$BV_{DSS}$	85	-	-	V
Drain-Source Leakage Current	$V_{DS} = 80 V, V_{GS} = 0 V$	$I_{DSS}$	-	-	1	$\mu A$
Gate Leakage Current	$V_{GS} = \pm 20 V, V_{DS} = 0 V$	$I_{GSS}$	-	-	$\pm 100$	nA
Gate-Source Threshold Voltage	$V_{DS} = V_{GS}, I_D = 250 \mu A$	$V_{GS(th)}$	2	-	4	V
Drain-Source On-State Resistance (Note 3)	$V_{GS} = 10 V, I_D = 20 A$	$R_{DS(on)}$	-	4.55	5.0	m $\Omega$
Forward Transconductance	$V_{DS} = 5 V, I_D = 20 A$	gfs	-	31	-	S
Gate Resistance	$V_{GS} = 0V, V_{DS} = 0V, f = 1MH$	RG	-	1.9	-	$\Omega$
Input Capacitance	$V_{DS} = 40 V, V_{GS} = 0V, f = 1MHz$	$C_{iss}$	-	3365	-	pF
Output Capacitance		$C_{oss}$	-	1264	-	pF
Reverse Transfer Capacitance		$C_{rss}$	-	46	-	pF
Turn-on Delay Time(Note2)	$V_{GS} = 10V, V_{DS} = 40V, R_L = 2.0\Omega, R_{GEN} = 3\Omega$	$t_{d(ON)}$	-	17.6	-	ns
Rise Time(Note2)		$t_r$	-	27	-	ns
Turn-Off Delay Time(Note2)		$t_{d(OFF)}$	-	31	-	ns
Fall Time(Note2)		$t_f$	-	10.8	-	ns
Total Gate Charge(Note2)	$V_{DS} = 40V, V_{GS} = 10V, I_D = 20A$	$Q_G$	-	56	-	nC
Gate to Source Charge(Note2)		$Q_{GS}$	-	18.3	-	nC
Gate to Drain Charge(Note2)		$Q_{GD}$	-	15	-	nC

**Source-Drain Diode Characteristics at Ta=25°C unless otherwise specified**

Characteristics	Test Condition	Symbo	Min.	Typ.	Max.	Unit
Maximun Body-Diode Continuous Current		$I_S$	-	-	120	A
Drain-Source Diode Forward Voltage	$V_{GS} = 0V, I_S = 1A, T_J = 25^\circ C$	$V_{SD}$	-	0.7	1.0	V
Reverse Recovery Time(Note2)	$T_J = 25^\circ C, I_F = 20A, di / dt = 100 A/\mu s$	trr	-	58	-	ns
Reverse Recovery Charge(Note2)		Qrr	-	95	-	nC

Note2:Pulse test: 300  $\mu$ s pulse width, 2 % duty cycle

**RATINGS AND CHARACTERISTIC CURVES**

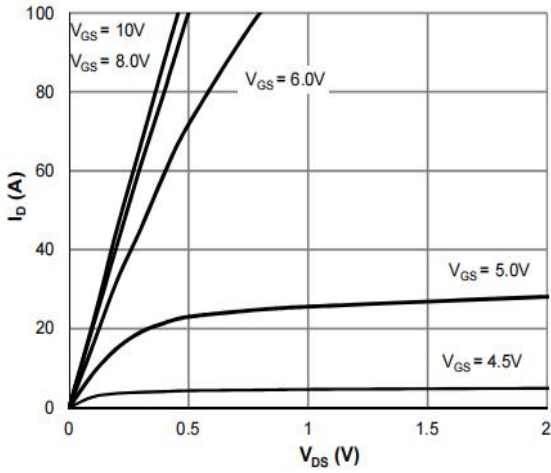


Figure 1: Saturation Characteristics

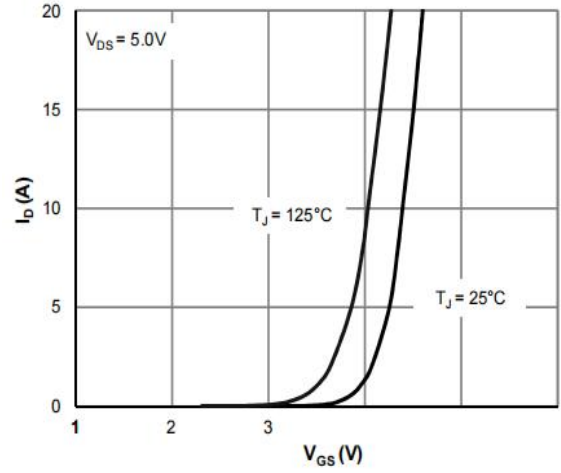


Figure 2: Transfer Characteristics

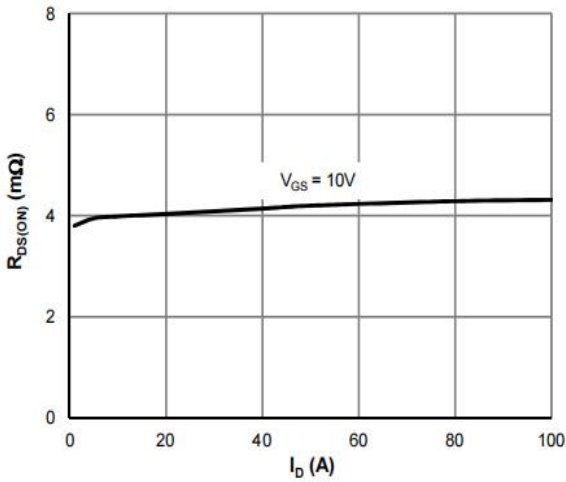


Figure 3:  $R_{DS(ON)}$  vs. Drain Current

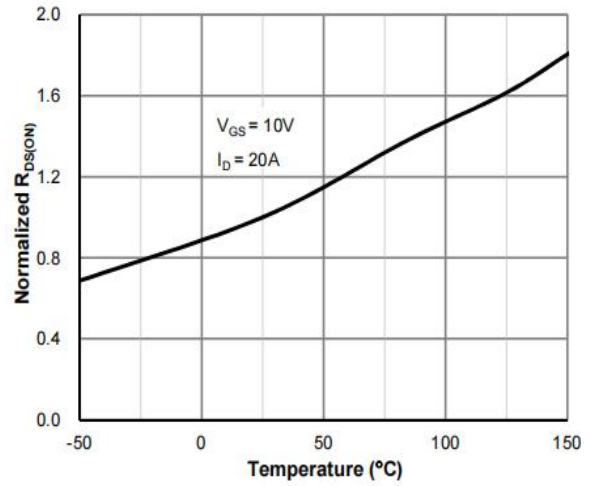


Figure 4:  $R_{DS(ON)}$  vs. Junction Temperature

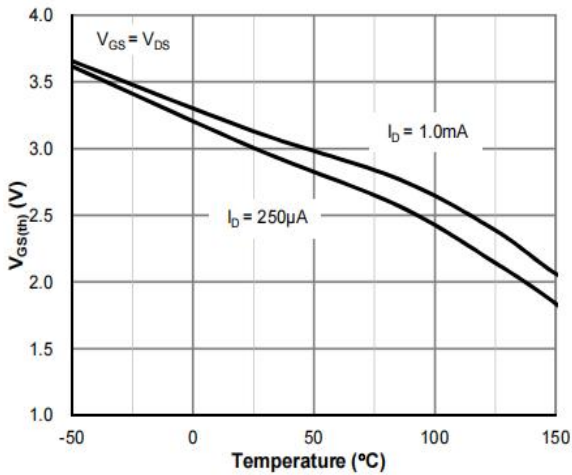


Figure 5:  $V_{GS(th)}$  vs. Junction Temperature

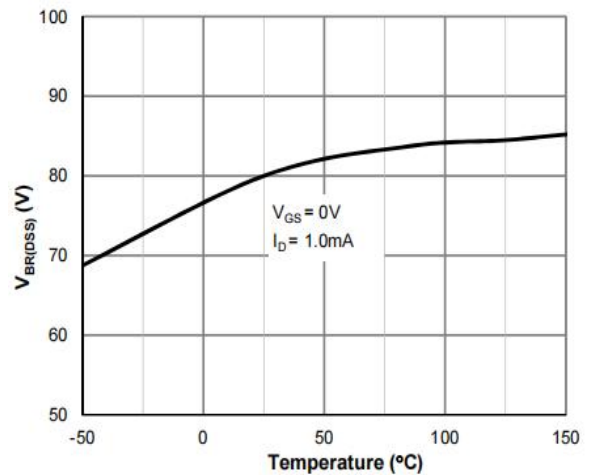


Figure 6:  $V_{BR(DSS)}$  vs. Junction Temperature

**RATINGS AND CHARACTERISTIC CURVES**

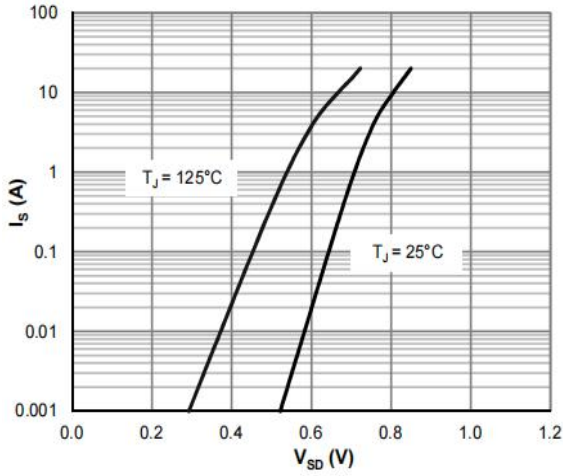


Figure 7: Body-Diode Characteristics

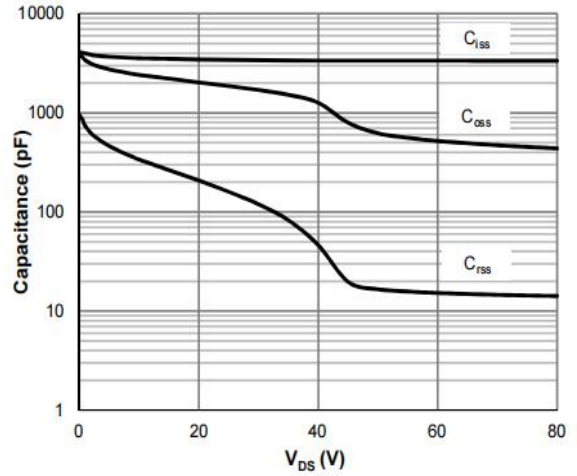


Figure 8: Capacitance Characteristics

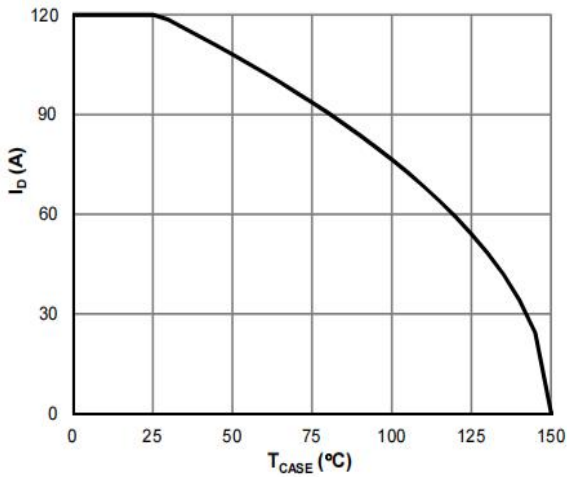


Figure 9: Current De-rating

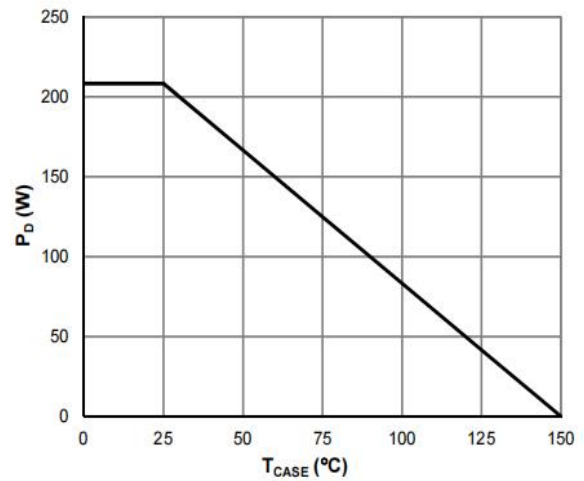


Figure 10: Power De-rating

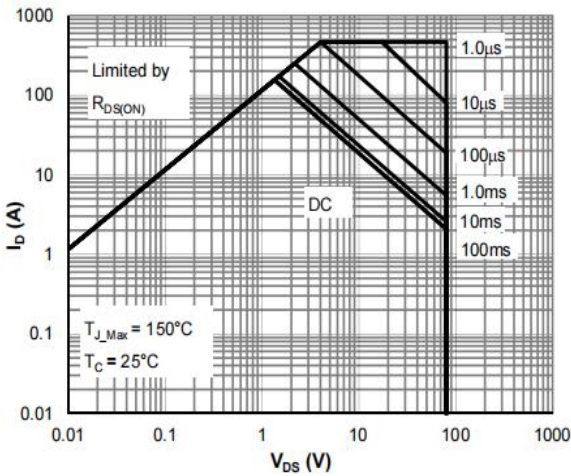


Figure 11: Maximum Safe Operating Area

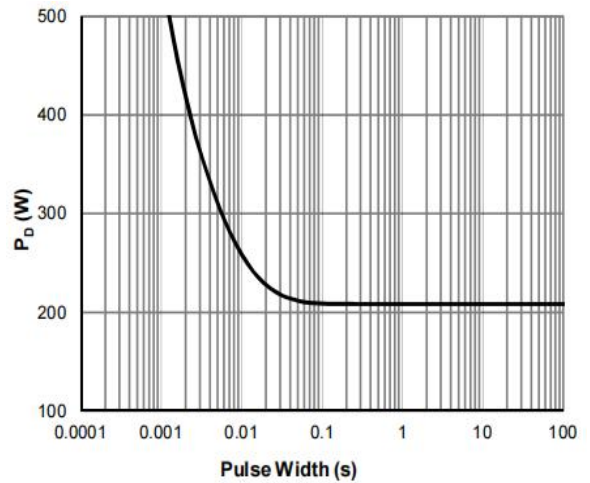
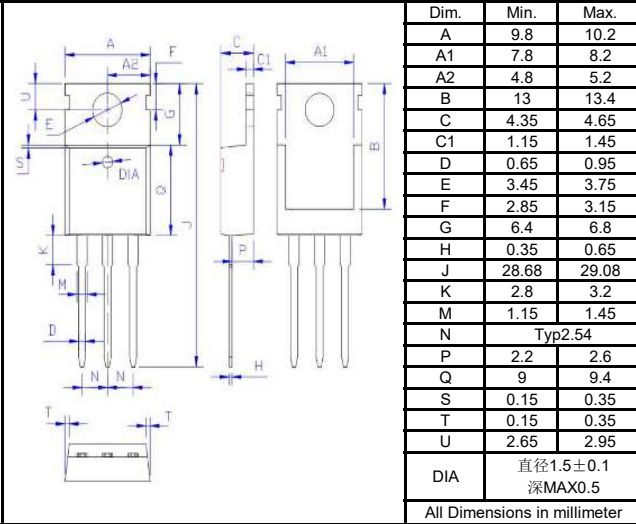


Figure 12: Single Pulse Power Rating, Junction-to-Case

Package Outline Dimensions millimeters

T0-220C



T0-263C

